General

Guideline Title

Diagnosis of hypertensive disorders of pregnancy and classification of blood pressure measurements. In: Diagnosis, evaluation, and management of the hypertensive disorders of pregnancy: executive summary.

Bibliographic Source(s)

Magee LA, Pels A, Helewa M, Rey E, von Dadelszen P, Hypertension Guideline Committee. Diagnosis of hypertensive disorders of pregnancy and classification of blood pressure measurements. In: Diagnosis, evaluation, and management of the hypertensive disorders of pregnancy: executive summary. J Obstet Gynaecol Can. 2014 May;36(5):418-25.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Magee LA, Helewa M, Moutquin JM, von Dadelszen P, Hypertension Guideline Committee, Society of Obstetricians and Gynaecologists of Canada. Diagnosis and classification. In: Diagnosis, evaluation, and management of the hypertensive disorders of pregnancy. J Obstet Gynaecol Can. 2008 Mar;30(3 Suppl 1):S9-15.

Recommendations

Major Recommendations

Definitions of the quality of evidence assessment (I-III) and classification of recommendations (A-E, L) are provided at the end of the "Major Recommendations" field.

Blood Pressure (BP) Measurement

1. BP should be measured with the woman in the sitting position with the arm at the level of the heart. (II-2A)
2. An appropriately sized cuff (i.e., length 1.5 times the circumference of the arm) should be used. (II-2A)
3. Korotkoff phase V should be used to designate diastolic BP. (I-A)
4. If BP is consistently higher in one arm, the arm with the higher values should be used for all BP measurements. (III-B)
5. BP can be measured using a mercury sphygmomanometer, a calibrated aneroid device, or an automated BP machine that has been validated for use in preeclampsia. (II-2A)
6. Automated BP machines that have not been validated for use in women with preeclampsia may underestimate or overestimate BP in those women; a comparison of readings using mercury sphygmomanometry or a calibrated aneroid device is recommended. (II-2A)
7. In the office setting, when BP elevation is non-severe and preeclampsia is not suspected, ambulatory BP monitoring or home BP monitoring is useful to confirm persistently elevated BP. (II-2C)
8. When home BP monitoring is used, maternity care providers should ensure that patients have adequate training in measuring their BP and

interpreting the readings. (III-C)

9. The accuracy of all BP measurement devices used in hospitals or offices should be checked regularly against a calibrated device. (II-3C)
10. The accuracy of all automated devices used for home BP monitoring should be checked regularly against a calibrated device. (III-C)

Diagnosis of Hypertension

11. The diagnosis of hypertension should be based on office or in-hospital BP measurements. (II-B)
12. Hypertension in pregnancy should be defined as an office (or in-hospital) systolic BP ≥140 mmHg and/or diastolic BP ≥90 mmHg, based on the average of *at least* 2 measurements, taken at least 15 minutes apart, using the same arm. (II-2B)
13. Resistant hypertension should be defined as the need for 3 antihypertensive medications for BP control at ≥20 weeks' gestation. (III-C)
14. A transient hypertensive effect should be defined as an office systolic BP ≥140 mmHg or a diastolic BP ≥90 mmHg that is not confirmed after rest, on repeat measurement, on the same or on subsequent visits. (II-2B)
15. A white-coat hypertensive effect refers to BP that is elevated in the office (i.e., systolic ≥140 mmHg or diastolic ≥90 mmHg), but <135 mmHg (systolic) and <85 mmHg (diastolic) on ambulatory or home BP monitoring. (II-2B)
16. A masked hypertensive effect refers to blood pressure that is normal in the office (i.e., systolic <140 mmHg and diastolic <90 mmHg) but elevated on ambulatory or home BP monitoring (i.e., systolic ≥135 mmHg or diastolic ≥85 mmHg). (II-2B)
17. Severe hypertension should be defined, in any setting, as a systolic BP of ≥160 mmHg or a diastolic BP of ≥110 mmHg based on the average of *at least* 2 measurements, taken at least 15 minutes apart, using the same arm. (II-2B)

Measurement of Proteinuria

18. All pregnant women should be assessed for proteinuria. (II-2B)
19. Urinary dipstick testing (by visual or automated testing) may be used for screening for proteinuria when the suspicion of preeclampsia is low. (II-2B)
20. Significant proteinuria should be defined as ≥0.3 g/d in a complete 24-hour urine collection or ≥30 mg/mmol urinary creatinine in a spot (random) urine sample. (II-2B)
21. Significant proteinuria should be suspected when urinary dipstick proteinuria is ≥1+. (II-2A)
22. More definitive testing for proteinuria (by urinary protein:creatinine ratio or 24-hour urine collection) is encouraged when there is a suspicion of preeclampsia, including: ≥1+ dipstick proteinuria in women with hypertension and rising blood pressure and in women with normal blood pressure, but symptoms or signs suggestive of preeclampsia. (II-2A)
23. Proteinuria testing does not need to be repeated once significant proteinuria of preeclampsia has been confirmed. (II-2A)
24. There is insufficient information to make a recommendation about the accuracy of the urinary albumin:creatinine ratio. (II-2L)

Classification of Hypertensive Disorders of Pregnancy (HDPs)

25. HDPs should be classified as pre-existing hypertension, gestational hypertension, preeclampsia, or "other hypertensive effects" on the basis of different diagnostic and therapeutic considerations. (II-2B) See Table 2 in the original guideline document.
26. The presence or absence of preeclampsia must be ascertained, given its clear association with more adverse maternal and perinatal outcomes. (II-2B)
27. In women with pre-existing hypertension, preeclampsia should be defined as resistant hypertension, new *or* worsening proteinuria, one or more adverse conditions, or one or more severe complications. (II-2B)
28. In women with gestational hypertension, preeclampsia should be defined as new-onset proteinuria, one or more adverse conditions, or one or more severe complications. (II-2B)
29. Severe preeclampsia should be defined as preeclampsia complicated by one or more severe complications. (II-2B)
30. Severe preeclampsia, as defined in this guideline, warrants delivery. (II-2B)
31. The term PIH (pregnancy-induced hypertension) should be abandoned, as its meaning in clinical practice is unclear. (III-D)

Investigations to Classify HDPs

32. For women with pre-existing hypertension, the following should be performed in early pregnancy (if not previously documented): serum creatinine, fasting blood glucose, serum potassium, and urinalysis (III-D), and electrocardiogram (EKG). (II-2C)
33. Among women with pre-existing hypertension or those with a strong clinical risk marker for preeclampsia, additional baseline laboratory testing may be based on other considerations deemed important by health care providers. (III-C)
34. Women with suspected preeclampsia should undergo the maternal laboratory (II-2B) and pertinent fetal (II-1B) testing. See Table 4 in the original guideline document.
35. Doppler velocimetry-based assessment of the fetal circulation may be useful to support a placental origin for hypertension, proteinuria, and/or adverse conditions including intrauterine growth restriction, (II-2B) and for the timing of delivery. (I-A)

36. There is insufficient evidence to recommend use of the biophysical profile as part of a schedule of fetal testing in women with a hypertensive disorder of pregnancy. (II-2L)
37. If initial testing is reassuring, but there is ongoing concern about preeclampsia (e.g., change in maternal and/or fetal condition), maternal and fetal testing should be repeated. (III-C)

Definitions:

Quality of Evidence Assessment*

I: Evidence obtained from at least one properly randomized controlled trial

II-1: Evidence from well-designed controlled trials without randomization

II-2: Evidence from well-designed cohort (prospective or retrospective) or case–control studies, preferably from more than one centre or research group

II-3: Evidence obtained from comparisons between times or places with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of treatment with penicillin in the 1940s) could also be included in this category

III: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees

*Adapted from The Evaluation of Evidence criteria described in the Canadian Task Force on Preventive Health Care.

Classification of Recommendations†

A. There is good evidence to recommend the clinical preventive action

B. There is fair evidence to recommend the clinical preventive action

C. The existing evidence is conflicting and does not allow to make a recommendation for or against use of the clinical preventive action; however, other factors may influence decision-making

D. There is fair evidence to recommend against the clinical preventive action

E. There is good evidence to recommend against the clinical preventive action

L. There is insufficient evidence (in quantity or quality) to make a recommendation; however, other factors may influence decision-making

†Adapted from the Classification of Recommendations criteria described in the Canadian Task Force on Preventive Health Care.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Hypertensive disorders of pregnancy (HDP):

- Pre-existing hypertension prior to pregnancy
- Gestational hypertension
- Preeclampsia
- Other hypertensive effects

Guideline Category

Diagnosis

Evaluation

Clinical Specialty

Cardiology

Family Practice

Internal Medicine

Obstetrics and Gynecology

Intended Users

Advanced Practice Nurses

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

- To present in brief the current evidence assessed in the clinical practice guideline prepared by the Canadian Hypertensive Disorders of Pregnancy Working Group and published by *Pregnancy Hypertension* to provide a reasonable approach to the diagnosis, evaluation, and treatment of the hypertensive disorders of pregnancy (HDP)
- To support evidence-based maternity care of women who are planning pregnancy and are at risk of a HDP, have an HDP in the current pregnancy, or are postpartum and had an HDP

Target Population

Women who are planning pregnancy and are at risk of a hypertensive disorder of pregnancy (HDP), have an HDP in the current pregnancy, or are postpartum and had an HDP

Interventions and Practices Considered

1. Blood pressure (BP) measurement (using an appropriately sized cuff, Korotkoff phase V, mercury sphygmomanometer, a calibrated aneroid device, or an automated BP machine that has been validated for use in preeclampsia)
2. Regular verification of all BP measurement/automated devices
3. Diagnosis of hypertension (based on office or in-home BP measurements and defined criteria)
4. Measurement/diagnosis of proteinuria (urinary dipstick testing, urinary protein:creatinine ratio, or 24-hour urine collection)
5. Classification of hypertensive disorders of pregnancy (HDP)
6. Evaluation of preeclampsia (based on defined criteria)

Major Outcomes Considered

- Risk of development of preeclampsia
- Maternal end-organ dysfunction
- Fetal manifestations of preeclampsia
- Preeclampsia imitators
- Maternal and perinatal morbidity
- Sensitivity and specificity of urinary protein measurement tests

- Accuracy of all blood pressure measurement devices

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Searches of Unpublished Data

Description of Methods Used to Collect/Select the Evidence

Published literature was retrieved through searches of MEDLINE, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and The Cochrane Library in March 2012 using appropriate controlled vocabulary (e.g., pregnancy, hypertension, pre-eclampsia, pregnancy toxemias) and key words (e.g., diagnosis, evaluation, classification, prediction, prevention, prognosis, treatment, postpartum follow-up). Results were restricted to systematic reviews, randomized control trials, controlled clinical trials, and observational studies published in French or English between January 2006 and February 2012. Searches were updated on a regular basis and incorporated in the guideline to September 2013. Grey (unpublished) literature was identified through searching the websites of health technology assessment and health technology-related agencies, clinical practice guideline collections, clinical trial registries, and national and international medical specialty societies.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Quality of Evidence Assessment*

I: Evidence obtained from at least one properly randomized controlled trial

II-1: Evidence from well-designed controlled trials without randomization

II-2: Evidence from well-designed cohort (prospective or retrospective) or case–control studies, preferably from more than one centre or research group

II-3: Evidence obtained from comparisons between times or places with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of treatment with penicillin in the 1940s) could also be included in this category

III: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees

*Adapted from The Evaluation of Evidence criteria described in the Canadian Task Force on Preventive Health Care.

Methods Used to Analyze the Evidence

Systematic Review

Description of the Methods Used to Analyze the Evidence

The quality of evidence in the guideline summarized here was rated using the criteria described in the Report of the Canadian Task Force on Preventative Health Care (see the "Rating Scheme for the Strength of the Evidence" field).

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Not stated

Rating Scheme for the Strength of the Recommendations

Classification of Recommendations*

A. There is good evidence to recommend the clinical preventive action

B. There is fair evidence to recommend the clinical preventive action

C. The existing evidence is conflicting and does not allow to make a recommendation for or against use of the clinical preventive action; however, other factors may influence decision-making

D. There is fair evidence to recommend against the clinical preventive action

E. There is good evidence to recommend against the clinical preventive action

L. There is insufficient evidence (in quantity or quality) to make a recommendation; however, other factors may influence decision-making

*Adapted from the Classification of Recommendations criteria described in the Canadian Task Force on Preventive Health Care.

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

The guideline has been prepared by the Canadian Hypertensive Disorders of Pregnancy Working Group, reviewed and approved by the Hypertension Guideline Committee, reviewed by the Maternal Fetal Medicine and Family Physician Advisory committees, and approved by the Executive and Council of the Society of Obstetricians and Gynaecologists of Canada.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

The expected benefit of this guideline is improved outcomes for mother, baby, and child through evidence-advised practice.

Potential Harms

Not stated

Qualifying Statements

Qualifying Statements

This document reflects emerging clinical and scientific advances on the date issued and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed. Local institutions can dictate amendments to these opinions. They should be well documented if modified at the local level. None of these contents may be reproduced in any form without prior written permission of the Society of Obstetricians and Gynaecologists of Canada (SOGC).

Implementation of the Guideline

Description of Implementation Strategy

Knowledge Translations Tools and Implementation of the Guideline

The Appendix (see Table 10 in the full version of the original guideline document [see the "Availability of Companion Documents" field]) lists tools to support the application of this guideline. Some Web sites provide general information about blood pressure (BP) measurement for non-pregnant patients, but the recommendations are similar enough to those for pregnant women to be useful. Patients, their partners, and their care providers should be well educated about the hypertensive disorders of pregnancy (HDP), and relevant sites are listed.

Implementation of any evidence depends on individual knowledge and beliefs, as well as institutional culture. Strong recommendations should be incorporated into clinical practice. In well-resourced settings, almost all preeclampsia-related maternal deaths involve substandard care.

Some updates to the 2008 Society of Obstetricians and Gynaecologists of Canada (SOGC) guidelines on the HDP may require additional effort to implement.

Recommendation 9 states that all measurement devices used in hospitals or offices should be checked regularly against a calibrated device may not be possible for all Canadian hospitals and offices to do on a regular basis.

Physicians should consider the category "other HDP" (white-coat and masked hypertension) as part of the classification of hypertensive women and consider using some form of out-of-office BP measurement to evaluate women with non-severe pre-existing or gestational hypertension.

Health care providers should inform pregnant women about the symptoms and signs of the HDPs and refer them to appropriate knowledge translation tools.

The developer recommends the use of corticosteroids for women ≤34+6 weeks' gestation who are at high risk of delivery within the next seven days. This gestational age cut-off represents a fundamental change in practice that will require discussion.

Physicians should be familiar with the blood bank policies of their own hospital.

Physicians should be aware of postpartum signs of maternal posttraumatic stress disorder and the maternal and perinatal long-term effects of HDPs, especially at this vulnerable time in maternal care when the maternity care provider is often handing back care to the primary care physician.

The reader is reminded to refer to the full open-access guideline published in *Pregnancy Hypertension*, which contains not only the recommendations presented here, but also all explanatory text and additional references.

Implementation Tools

Foreign Language Translations

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Magee LA, Pels A, Helewa M, Rey E, von Dadelszen P, Hypertension Guideline Committee. Diagnosis of hypertensive disorders of pregnancy and classification of blood pressure measurements. In: Diagnosis, evaluation, and management of the hypertensive disorders of pregnancy: executive summary. J Obstet Gynaecol Can. 2014 May;36(5):418-25.

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2008 Mar (revised 2014 May)

Guideline Developer(s)

Society of Obstetricians and Gynaecologists of Canada - Medical Specialty Society

Source(s) of Funding

Society of Obstetricians and Gynaecologists of Canada

Guideline Committee

Composition of Group That Authored the Guideline

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Financial Disclosures/Conflicts of Interest

Disclosure statements have been received from all members of the committee.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Magee LA, Helewa M, Moutquin JM, von Dadelszen P, Hypertension Guideline Committee, Society of Obstetricians and Gynaecologists of Canada. Diagnosis and classification. In: Diagnosis, evaluation, and management of the hypertensive disorders of pregnancy. J Obstet Gynaecol Can. 2008 Mar;30(3 Suppl 1):S9-15.

Guideline Availability

Electronic copies: Available in Portable Document Format (PDF) from the Society of Obstetricians and Gynaecologists of Canada (SOGC) Web site. Also available in French from the SOGC Web site.

Print copies: Available from the Society of Obstetricians and Gynaecologists of Canada, La société des obstétriciens et gynécologues du Canada (SOGC) 780 promenade Echo Drive Ottawa, ON K1S 5R7 (Canada); Phone: 1-800-561-2416.

Availability of Companion Documents

The following is available:

- Magee LA, Pels A, Helewa M, Rey E, Von Dadelszen P, Canadian Hypertensive Disorders of Pregnancy (HDP) Working Group. Diagnosis, evaluation, and management of the hypertensive disorders of pregnancy. Pregnancy Hypertens. 2014 Apr;(4)2:104-45. Electronic copies: Available from the Pregnancy Hypertension: An International Journal of Women's Cardiovascular Health Web site.

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on February 17, 2009. The information was verified by the guideline developer on March 13, 2009. This summary was updated by ECRI Institute on June 5, 2014. The information was verified by the guideline developer on June 23,

2014.

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